



**Case Report**

JMR 2020; 6(1): 7-8  
January- February  
ISSN: 2395-7565  
© 2020, All rights reserved  
www.medicinarticle.com  
Received: 05-01-2020  
Accepted: 11-02-2020

**A case report on ossified thyroid cartilage**

**Anjali Sabnis<sup>1</sup>, Prakash Mane<sup>2</sup>**

*1 Professor and Head, Department of Anatomy, MGM Medical College, Navi Mumbai- 410209, Maharashtra, India  
2 Tutor, Department of Anatomy, MGM Medical College, Navi Mumbai- 410209, Maharashtra, India*

**Abstract**

During retrieval of bones from 44 years male cadaver in the department of Anatomy of MGM Medical Navi Mumbai, we observed thyroid cartilage was completely ossified. Thyroid cartilage is largest hyaline cartilage of larynx which gives attachment to muscles, membrane and ligaments. It also protects vocal cords which is a very important function of thyroid cartilage. Ossification of thyroid cartilage is rare phenomenon and knowledge regarding it should not be ignored.

**Keywords:** Thyroid cartilage, Adam’s apple, Ossified thyroid cartilage, Ossified hyaline cartilage.

**INTRODUCTION**

Thyroid cartilage (TC) is the largest cartilage of larynx which is derived from 4th pharyngeal arch. It lies at the level between 4th and 5th cervical vertebra. TC forms anterior wall of larynx and protects vocal cords. TC is made up of two laminae which unite anteriorly and forms laryngeal prominence called Adam’s apple which is more prominent in males than in females. Posteriorly laminae form superior and inferior cornue. Thyrohyoid membrane is attached to superior border of thyroid laminae and inferior border of hyoid bone while inferiorly TC forms joint with cricoid cartilage and forms cricothyroid ligament in the centre. The laminae of TC also serve as attachment sites for several muscles in the neck [1]. TC is hyaline cartilage which may undergo ossification and calcification as aging process [2]. The mineralization of human thyroid cartilage occurs usually after the end of adolescence. In both the sexes the ossification of thyroid cartilage begins at the posterior border, the lower margin and the inferior horn [3]. The ossification of thyroid cartilage commences about the 25th year and by the 65th year the cartilage may be completely converted into bone in males. In females, thyroid cartilage never ossifies completely and it leaves the ventral half has cartilaginous part [4]. Ossified TC is rare and can be an incidental finding as it may not be associated with symptoms. It may be associated with symptoms of compression of internal and external laryngeal nerves which are the branches of superior laryngeal nerve. It may be noticed either on radiograph or during retrieval of bone or during teaching. Judging the age will be easy if ossified TC is observed. Knowing ossification of TC is significant.

**CASE REPORT**

During retrieval of bones from 44 years male cadaver in the department of Anatomy of MGM Medical Navi Mumbai, we observed thyroid cartilage was ossified. TC was completely ossified except anteroinferior corner and postero-superior corner part of both the laminae.

1. Length of superior border of left lamina is 5 cm
2. Length of superior border of right lamina is 5.4 cm
3. Inferior border of both laminae is 6.1 cm
4. Distance between end of superior cornue and inferior cornue of left side is 4.4cm
5. Distance between end of superior cornue and inferior cornue of right side is 3.3cm

**\*Corresponding author:**

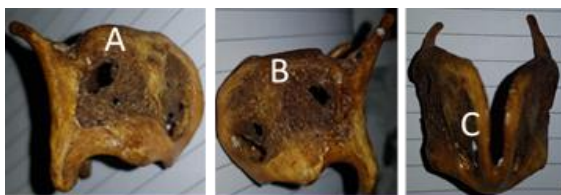
**Dr. Anjali Sabnis**  
Professor and Head,  
Department of Anatomy, MGM  
Medical College, Navi  
Mumbai- 410209, Maharashtra,  
India  
Email:  
dranjus2003[at]yahoo.com

## DISCUSSION

The thyroid cartilage is largest, unpaired and uppermost cartilage of laryngeal cartilages which has hyaline variety of cartilage. Through the attachments of ligaments, muscles and membranes, TC forms anterior boundary of larynx and protects vocal cords. Thyroid cartilage may be converted into bone through the process of endochondral ossification. This phenomenon is rarely seen in case of TC. Complete or partial ossification may form thyroid bone. The mechanism of mineralisation and ossification in human TC is not well understood [5]. Usually ossification is seen over the age of 20 years [6] and begins slightly later in females than in males [7]. TC is strong and flexible structure. During phonation it plays important role through its movements. Because of ossification TC can become strong, tough and fix structure with which there could be loss of flexibility. The neurovascular structures which are in the vicinity of TC may get compressed and compression effects may be seen.

Ossification of TC follows progressive pattern and though the pattern is similar in different individuals its timing is very variable and appears not to be sex related. Ossification process takes place in 5 stages in TC. It begins near posterior-inferior border of lamina and then extends into inferior horn to posterior border and then towards superior horn. After that it spreads to main part of TC. It is common that there could be one or two windows of unossified or less ossified area in the centre of each lamina [7]. In the present case we noticed the ossification is complete except at two places. Small windows are seen in the posterosuperior and anteroinferior region of each lamina. Whole cartilage may get ossify to form "os thyroideum". Calcification precedes endochondral ossification and fatty and cellular marrow may be seen in it [7].

Incidence of ossified TC is rare and most of the times it is incidental finding. Four female cadavers (7.41%) (Aged 24 yrs, 26yrs, 26yrs and 30 yrs old) had unusual ossified thyroid cartilages. It was observed that the parts of thyroid cartilage i.e. Laryngeal prominence, inferior horns, superior horns and laminae except a small central part were ossified [8]. Bilateral ossification of TC was observed in 42 years old lady which showed bony tissue was filled with a cartilaginous matrix, with a normally ossified bone trabeculum [9]. An ossified thyroid cartilage was observed. The posterior border, the lower margin, the inferior horn, superior horn and the laminae of the thyroid cartilage were completely ossified [10]. In the present study except at 2 windows i.e. at postero-superiorly and antero-inferiorly, all parts of TC were ossified. Partial ossified TC may be mistaken for foreign body and windows may be seen radiolucent. Ossified TC may create suspicion of metastatic calcification or generalized state of hypermineralization [10]. Detail history and investigations will be able to rule out the conditions. Fracture of ossified TC is likely to occur with blunt trauma and can injure nerves like internal laryngeal nerve which is close to superior cornue of TC. Elasticity of TC prevents TC from breaking and protects it. With the ossification knowledge of TC one can judge the age of the person in medicolegal cases if found with ossified TC. Anatomical location of TC, its structure, relations and ossification should be given importance as it is clinically significant.



A- Left lamina of ossified TC  
B- Right lamina of ossified TC  
C- Frontal view of ossified TC

Figure 1: Photograph shows ossified thyroid cartilage

## CONCLUSION

Ossified thyroid cartilage is rare phenomenon and should not be ignored. Its morphological aspect carries weightage as it is related to important structures. Observation of ossified thyroid cartilage as accidental finding gives clue to investigate the patient completely.

## REFERENCES

1. Mupparapu M, Vuppapapati A. Ossification of laryngeal cartilages on lateral cephalometric radiographs. *The Angle Orthodontist*. 2005;75(2):196-201.
2. Chakravarthi KK, Venumadhav N, Thomas H. Ossified Cartilago thyreoidea and its clinical insight: a cadaveric study. *Int J Bioassays*. 2013;2:1044-7.
3. Kirsch T, Claassen H. Matrix vesicles mediate mineralization of human thyroid cartilage. *Calf Tissue Int* 2000;66:292-297.
4. Salman RA, Kinney LA. Calcified thyroid cartilage. *Oral surg oral med oral pathol* 1990;70:806-807.
5. Kirsch T, Claassen H. Matrix vesicles mediate mineralization of human thyroid cartilage. *Calcif Tissue Int*. 2000;66:292-297.
6. Mupparapu M, Vuppapapati A. Detection of an early ossification of thyroid cartilage in an adolescent on a lateral cephalometric radiograph. *The Angle Orthodontist*. 2002;72(6):576-8.
7. Louise S. *The Head Neck and Dentition, In development Juvenile osteology*, Elsevier, 2000, pp-36-170.
8. Chakravarthi KK, Venumadhav N, Thomas H. Ossified Cartilago thyreoidea and its clinical insight: a cadaveric study. *Int J Bioassays*. 2013;2:1044-7.
9. Galline J, Marsot-Dupuch K, Bigel P, Lasjaunias P. Bilateral dystrophic ossification of the thyroid cartilage appearing as symmetrical laryngeal masses. *American journal of neuroradiology*. 2005;26(6):1339-41.
10. Jaiprabhu SP, Prabhu K. Ossified Thyroid Cartilage: A Tool for Determining Age and Sex of an Individual. *Medical Science*. 2015;4(10):190.